

REMARKS

Status of the Claims:

Claims 1, 10-27, 37, 38, and 52 have been amended. Claim 53 has been cancelled. Claims 54 and 55 have been added. After amending the claims as set forth above, claims 1-50, 52, 54, and 55 are now pending in this application.

I. Claim Rejections – 35 U.S.C. § 103

A. The Choi, Cano, Gibson, and Kikumoto References

Claims 1-50, and 53 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Choi (US 2003/0014246), Cano et al. (Voice Morphing System for Impersonating in Karaoke Applications) (Cano), Gibson (US 6,336,092) (Gibson), and Kikumoto et al. (US 6,323,797) (Kikumoto). These rejections are respectfully traversed in view of the claims as amended herein.

Independent claim 1 recites a vocoder system comprising:

formant detection means for analyzing a first musical tone signal to detect formant characteristics of the first musical tone signal;

musical tone signal input means for inputting a second musical tone signal that corresponds to specified pitch information;

formant generation means for generating new formant characteristics of the first musical tone signal based on the formant characteristics of the first musical tone signal, formant control information for generating the new formant characteristics from the formant characteristics, and the specified pitch information corresponding to the second musical tone signal;

division means for dividing the second musical tone signal into a plurality of frequency bands, the respective center frequencies of which have been fixed;

setting means for setting modulation levels, based on the new formant characteristics of the first musical tone signal, only at the fixed center frequency of each of the frequency bands of the second musical tone signal; and

modulation means for modulating a level of a signal of each of the frequency bands of the second musical tone signal based on the respective modulation level set in the setting means.

(Similar features are found in independent claims 37 and 38.)

Thus, a vocoder sets modulation levels, based on new formant characteristics of a first musical tone signal, only at the fixed center frequency of each of the frequency bands of a second musical tone signal. Choi, Cano, Gibson, and Kikumoto, alone or in the combination suggested by the Examiner does not teach, suggest, or render predictable a system, as recited in claim 1, including these features.

According to the Examiner, Choi discloses:

a vocoder system (and corresponding method) comprising: formant detection means for analyzing a first tone signal to detect formant characteristics of the first tone signal ("voice signal of the subscriber... detect the spectrum parameter", paragraph 46; "spectrum parameter... are detected", paragraph 47; where the spectrum of a signal comprises, among other things, the formants of a voice) tone signal input means for inputting a second tone signal that corresponds to specified pitch information ("selects the kind of the effect. .. converts the spectrum parameter... with reference to the loaded spectrum parameter... conversion of the spectrum parameter... height of voice", paragraph 47) setting means for setting modulation levels based on the formant characteristics and formant control information with which the formant characteristics detected by the formant detection means are changed ("selects the kind of the effect... converts the spectrum parameter... with reference to the loaded spectrum parameter... conversion of the spectrum parameter... height of voice", paragraph 47; "modulating", paragraph 38; = where interpolating one part of the spectrum where the input and target are relatively similar necessarily has a different modulation set relative [i.e. compared to] other modulated frequency values/levels in other frequencies where the difference between the input and target are different.) modulation means for modulating a level of a signal based on the modulation level set in the setting means ("modulating", paragraph 38).

See Office Action dated June 1, 2010 (*Office Action*) at section 2.

As acknowledged by the Examiner, Choi does not disclose that “the tone signals are musical tone signals.” *See id.* As a result, the Examiner cites Cano, which, according to the Examiner, teaches “the tone signals are musical tone signals (“target singer”, Introduction). *See id.*

As acknowledged by the Examiner, Choi, in view of Cano, does not disclose:

division means for dividing the second musical tone signal into a plurality of frequency bands, the respective center frequencies of which have been fixed, where the modulation levels are set only at the fixed center frequency of each of the frequency bands, and where modulating the level of a signal modulates levels of each of the frequency bands, and where the frequencies are of each of the frequency bands.

See id. As a result, the Examiner cites Gibson, which, according to the Examiner, teaches:

division means for dividing the second musical tone signal into a plurality of frequency bands, the respective center frequencies of which have been fixed ("signal is split into two equal-width frequency bands... gain compensation ... transformed ", col. 9, lines 44-65; where the defined frequency bands naturally cover a range of frequencies, which has a frequency in the middle of the range) where the modulation levels are set at the fixed center frequency of each of the frequency bands, and where modulating the level of a signal modulates levels of each of the frequency bands, and where the frequencies are of each of the frequency bands ("signal is split into two equal-width frequency bands... gain compensation ... transformed ", col. 9, lines 44-65; "summing a gain-compensated high-frequency signal and the transformed low-frequency component", col. 9, line 65 - col. 10, line 2; "source and target voice signals", col. 7, lines 17-28; where the gain compensation and transformation is a form of modulation, and to determine the target voice characteristics and the necessary transformations, an analysis of the target voice signals in the corresponding frequency bands is obvious/necessary).

See id.

As acknowledged by the Examiner, Choi, in view of Cano and Gibson, does not disclose that “the modulation levels are set only at the fixed center frequencies.” *See id.* As a result, the Examiner cites Kikumoto, which, according to the Examiner, teaches:

the modulation levels are set only at the fixed center frequencies ("combining section, the sine waves of said center frequencies of each of the frequency bands... are modulated", col. 2, line 40 - col. 3, line 17, especially col. 2, line 64 - col. 3, line 6; where Kikumoto teaches an alternative audio signal modulation technique that operates by modulating only the frequencies of the center frequencies of different frequency bands).

See id.

However, in contrast to amended claim 1, Kikumoto does not disclose a vocoder that sets modulation levels, based on new formant characteristics of a first musical tone signal, only at the fixed center frequency of each of the frequency bands of a second musical tone signal. In particular, Kikumoto discloses that prior art vocoder systems modulate levels, based on formant characteristics of a first signal, at the fixed center frequency for each of the frequency bands of the first signal (i.e., the same signal). *See* Kikumoto at col. 2 l. 40 to col. 3 l. 6. Specifically, the cited Kikumoto patent recites, "the sine waves of said center frequencies of each of the frequency bands that have been analyzed are modulated by the amplitude values and the instantaneous frequencies that have been analyzed." *See* Kikumoto at col. 2 l. 67 to col. 3 l. 3; *see also* col. 2 ll. 45-55 (discussing the frequencies bands and the amplitude values and instantaneous frequencies that have been analyzed). In particular, the same musical signal processed by the analysis bank is the signal that is modulated. That is, the frequency bands "that have been analyzed" are of the same signal as that which produced the amplitude values and the instantaneous frequencies ("that have been analyzed"). Thus, in other words, according to this reference, prior art vocoder systems modulate levels (at the fixed center frequencies of each of the frequency bands) of a signal using the formant characteristics of the same signal.

As such, the cited Kikumoto patent does not appear to disclose a vocoder that sets modulation levels, based on new formant characteristics of a first musical tone signal, only at the fixed center frequency of each of the frequency bands of a second musical tone signal.

Cano, Choi, and Gibson not address this distinction with claim 1.

To establish a prima facie obviousness of a claim invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981 (CCPA 1974). Because none

of the references disclose or suggest the recited features of claim 1, there can be no prima facie obviousness by seeking to combine these references.

Therefore, for at least the reasons above, Choi, Cano, Gibson, and Kikumoto do not anticipate, suggest, or render predictable independent claims 1, 37, and 38. Claims 2-36, and 41-50 depend from claim 1 (directly or indirectly) and are allowable for at least the same reasons as claim 1 is allowable. Claims 39, 40, and 53 depend from claim 38 (directly or indirectly) and are allowable for at least the same reasons as claim 38 is allowable. Accordingly, the rejections of claims 1-50, and 53, as amended herein, are respectfully traversed.

B. The Choi, Cano, Gibson, Flanagan, and Kikumoto References

Claim 52 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Choi, Cano, Gibson, Flanagan, and Kikumoto. This rejection is respectfully traversed in view of the claims as amended herein.

Independent claim 52 recites a system comprising:

formant detection means for analyzing a first musical tone signal to detect formant characteristics of the first musical tone signal;

musical tone signal input means for inputting a second musical tone signal that corresponds to specified pitch information;

formant generation means for generating new formant characteristics of the first musical tone signal based on the formant characteristics of the first musical tone signal, formant control information for generating the new formant characteristics from the formant characteristics, and the specified pitch information corresponding to the second musical tone signal;

filtering means for dividing the second musical tone signal into a plurality of frequency bands based on respective fixed center frequencies;

setting means for setting modulation levels, based on the new formant characteristics of the first musical tone signal, only at the fixed center frequency of each of the frequency bands of the second musical tone signal; and

modulation means for modulating a level of a signal of each of the frequency bands of the second musical tone signal based on the respective modulation level set in the setting means.

Thus, a vocoder sets modulation levels, based on new formant characteristics of a first musical tone signal, only at the fixed center frequency of each of the frequency bands of a second musical tone signal. Choi, Cano, Gibson, Flanagan, and Kikumoto, alone or in the combination suggested by the Examiner does not teach, suggest, or render predictable a vocoder system, as recited in claim 52, including these features.

As acknowledged by the Examiner, Choi, in view of Cano and Gibson, “fail to teach where the division is based on respective fixed center frequencies.” *See Office Action* at section 3. As a result, the Examiner cites Flanagan, which according to the Examiner, teaches “where the division is based on respective fixed center frequencies (“partition the received signal into subbands having center frequencies”, col. 8, lines 44-62; where Flanagan teaches that the division of a signal into subbands can be based on what the center frequencies are).” *See id.*

As acknowledged by the Examiner, Choi, in view of Cano, Gibson, and Flanagan “fail to teach that the modulation levels are set only at the fixed center frequencies. *See id.* at section 3.

As a result, the Examiner cites Kikumoto, which, according to the Examiner, teaches:

the modulation levels are set only at the fixed center frequencies
 (“combining section, the sine waves of said center frequencies of
 each of the frequency bands... are modulated”, col. 2, line 40 - col.
 3, line 17, especially col. 2, line 64 - col. 3, line 6; where Kikumoto
 teaches an alternative audio signal modulation technique that
 operates by modulating only the frequencies of the center
 frequencies of different frequency bands).

See id.

However, in contrast to amended claim 52, Kikumoto does not disclose a vocoder that sets modulation levels, based on new formant characteristics of a first musical tone signal, only at the fixed center frequency of each of the frequency bands of a second musical tone signal. In particular, Kikumoto discloses that prior art vocoder systems modulate levels, based on formant characteristics of a first signal, at the fixed center frequency for each of the frequency bands of the first signal (i.e., the same signal). *See Kikumoto* at col. 2 l. 40 to col. 3 l. 6. Specifically, the cited Kikumoto patent recites, “the sine waves of said center frequencies of each of the frequency bands that have been analyzed are modulated by the amplitude values and the instantaneous

frequencies that have been analyzed.” See Kikumoto at col. 2 l. 67 to col. 3 l. 3; *see also* col. 2 ll. 45-55 (discussing the frequencies bands and the amplitude values and instantaneous frequencies that have been analyzed). That is, the frequency bands “that have been analyzed” are of the same signal as that which produced the amplitude values and the instantaneous frequencies (“that have been analyzed”). Thus, in other words, according to this reference, prior art vocoder systems modulate levels (at the fixed center frequencies of each of the frequency bands) of a signal using the formant characteristics of the same signal.

As such, the cited Kikumoto patent does not appear to disclose a vocoder that sets modulation levels, based on new formant characteristics of a first musical tone signal, only at the fixed center frequency of each of the frequency bands of a second musical tone signal.

Cano, Choi, Flanagan, and Gibson do not address this distinction with claim 52.

To establish a prima facie obviousness of a claim invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981 (CCPA 1974). Because none of the references disclose or suggest the recited features of claim 52, there can be no prima facie obviousness by seeking to combine these references.

Therefore, for at least the reasons above, Choi, Cano, Gibson, Flanagan, and Kikumoto do not anticipate, suggest, or render predictable independent claim 52. Accordingly, the rejection of claim 52, as amended herein, is respectfully traversed.

II. New Claims:

New claims 54-55 are added to further protect additional features of the present invention.

Claim 54 generally recites, among other features,

first signal division means for dividing the first musical tone signal into a plurality of frequency bands, the respective center frequencies of which have been fixed;

a level detection means for detecting a level of each of the frequency bands of the first musical tone signal;

the formant detection means for detecting the formant characteristics of the first musical tone signal based on the detected levels of each of the frequency bands of the first musical tone signal.

This claim is supported by the original application, for example, in paragraph [0040]. This claim is not disclosed or suggested by the cited reference(s). For instance, Kikumoto modulates the same signal (i.e., the first musical signal) processed by the analysis bank, which contains the filters for dividing the first musical signal. See Kikumoto at col. 2 l. 40 to col. 3 l. 6. Moreover, this claim is allowable at least for the reasons of its parent claim and/or the reasons previously discussed.

Claim 55 generally recites, among other features,

wherein the center frequency of each of the frequency bands of the first musical tone signal is less than the center frequency of each of the frequency bands of the second musical tone signal.

This claim is supported by the original application, for example, in paragraph [0075]. This claim is not disclosed or suggested by the cited reference(s). For instance, Kikumoto does not describe two sets of frequency bands, much less sets of frequencies bands with different center frequencies from each other. Moreover, this claim is allowable at least for the reasons of its parent claim and/or the reasons previously discussed.

III. Conclusion:

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

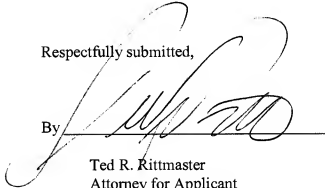
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Respectfully submitted,

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